

Methods of Summarizing Data

Supervised learning

Unsupervised learning

Unsupervised learning

Without external standard →

Problems related to internal structure analysis

Common in
biotechnology
field

Cluster analysis: Data are summarized by gathering similar data.
Principal component analysis: Data are summarized such that the loss of original information is minimized.

Psychology

Factor analysis: Data are summarized based on a mathematical model.

Need for Supervised Learning

Supervised learning

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With external standard →

Problems related to prediction, discrimination, or diagnosis

Comparison of two groups is needed for realization of personalized medicine.

< Examples of comparison >

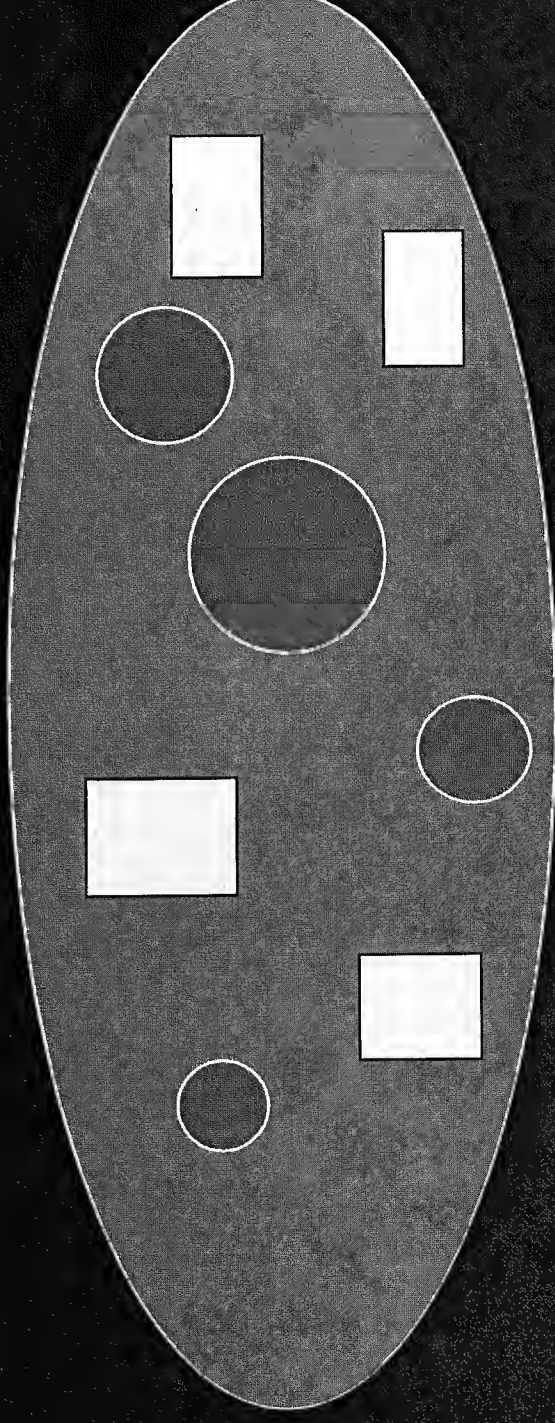
1. Normal tissue vs. Cancer tissue
2. Primary cancer vs. Metastatic cancer
3. Before agent administration vs. After agent administration
4. Pre-radiation vs. Post-radiation
5. Recurrent cancer vs. Non-recurrent cancer

Supervised Learning vs. Unsupervised Learning

Unsupervised learning (conventional technique)

Cancerous samples ○

Non-cancerous samples ■

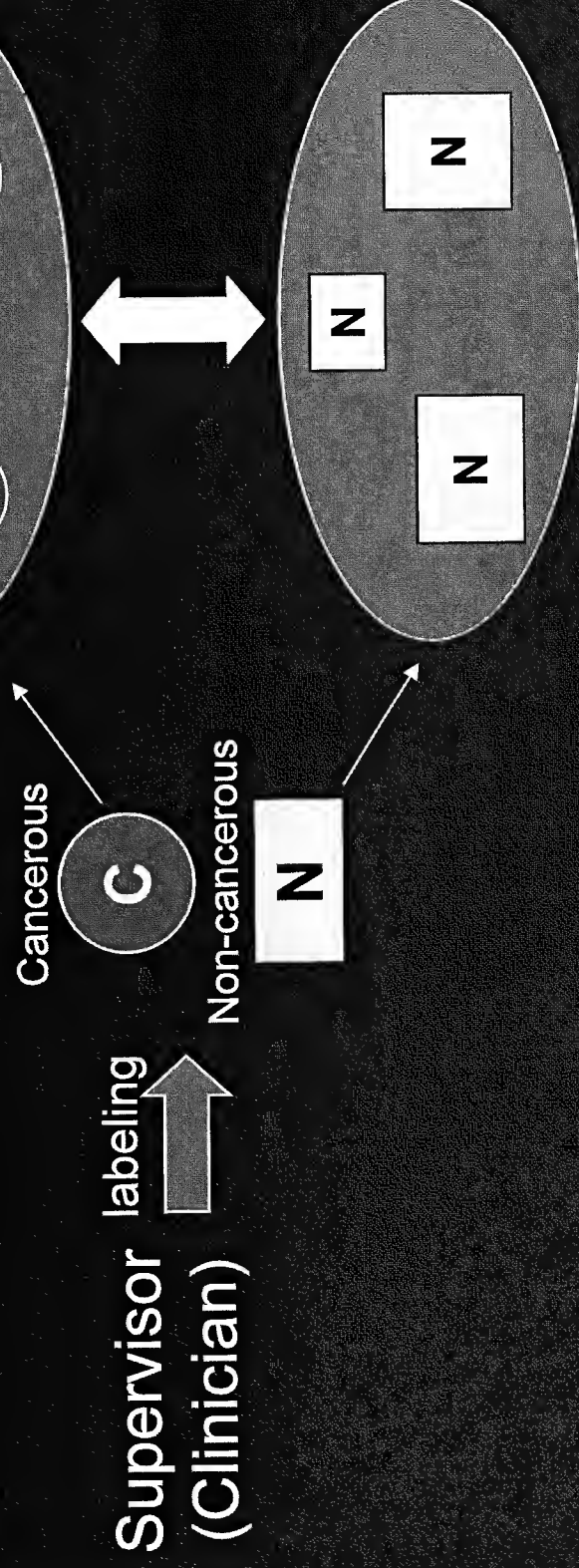


Analysis is performed on the mixture of cancerous and non-cancerous samples.

Supervised Learning vs. Unsupervised Learning

Supervised learning

Using samples that are labeled
by a supervisor in advance



Analysis is performed by comparing cancerous and non-cancerous samples.